WATER QUANTITY SURVEYS COST SHARING AGREEMENT

CANADA - NEW BRUNSWICK

ANNUAL REPORT 1990-91

TO: Dr. N. D. Elhadi
Administrator for New Brunswick

Mr. S. L. Fenety
Administrator for Canada

In accordance with Article XII of the Memorandum of Agreement covering Water Quantity Surveys in the Province of New Brunswick, we submit herewith the annual report for fiscal year 1990-91.

Members of the Coordinating Committee

M. Sprague
Member for New Brunswick
Fredericton, New Brunswick

R. D. McBride
Member for Canada
Dartmouth, Nova Scotia

92-04702/

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INTRODUCTION

The year ending March 31, 1991 was the sixteenth in which water quantity surveys in New Brunswick were conducted under a Memorandum of Agreement between the Federal and Provincial Governments.

The Agreement establishes the basis on which cooperative water quantity surveys are made. It is administered for Canada by the Regional Director of the Inland Waters Directorate and for New Brunswick by the Director, Environmental Planning & Science Branch, Department of the Environment. A Co-ordinating Committee comprising the Chief, Water Resources Branch, Inland Waters Directorate, and the Manager, Water Resource Monitoring Section, Environment Planning & Science Branch reports to the Administrators. It is the responsibility of the Co-ordinating Committee to prepare annually Schedules A and D for approval by the Administrators.

The Memorandum of Agreement includes four schedules:

1. Schedule A is a list of water quantity stations operated under the terms of the Agreement and their responsibility classification as: federal, federal-provincial or provincial.

2. Schedule B is a list of items that are to be included for cost sharing under the Agreement.

3. Schedule C details procedures for computing annual payments.

4. Schedule D provides a summary of annual payments.

Schedules A and D for 1990-91 are attached to this report in Appendicies II and VII.

SUMMARY OF ACTIVITIES

The Canada-New Brunswick Co-ordinating Committee met once during 1990-91 on February 19, 1991 at Fredericton. The main points covered at the meeting were as follows:

- The Annual Report for 1989-90 was reviewed and attention focussed upon the balance of payments over the years of the Agreement. As a result of a significant overexpenditure (interim wage settlement, major maintenance) during 1989-90 the Provincial credit changed to a Federal credit of $7635.

- The recommendations from the Network Evaluation and Planning Advisory Committee were presented. It was agreed to discontinue the station on Bass River, where channel instability existed, and establish a new station on the Black River near Sain John. Also, it was agreed to establish a miscellaneous sediment sampling program at a dozen sites where hydrometric stream gauging presently exists.

- The schedule "A" listing of stations to be operated, and the estimate of costs for 1991-92 were agreed to by the Co-ordinating Committee.

- The arrangement for processing the charts for the 8 groundwater wells would continue.

- The Province was briefed on the status of the Federal Water Resources Branch moderinization plan.

- WRB agreed to honour its commitment in upgrading 3 stations with data loggers complete with modem.

- The significance of the Green Plan to the Agreement was discussed.

A copy of the notes form the 1990-91 Co-ordinating Committee meeting is included in Appendix XI.

During 1990-91, eighty-three stations were operated, designated as follows: Federal 41, Federal-Provincial 26, Provincial 16. The Province paid $112,224 through Schedule "D" payments toward the $342,456 operational cost of these stations.

The one significant change to the hydrometric network this year involved the deletion of the Mamozekel River hydrometric station and the addition of a flow station on the Iroquois River at Moulin Morneault. The discontinuance of the Mamozekel station was necessitated by morphological changes at the gauge site which made accurate data collection impossible. The new station on the Iroquois River will provide additional information for flow forecasting. Also, it is located in a designated surface water supply basin and fulfils the need for a small watershed in the area.

The shelter and recorder for the Iroquois River station were obtained from the Mamozekel River site while the manometer was supplied from WSC stock. The work was completed by Water Resources Branch (WRB) staff with assistance from the New Brunswick Electric Power Commission who provided a post hole driller and labour.

The cost shared sediment program continued with six stations being operated, designed as follows: Federal 2, Federal-Provincial 4. The Province paid $3,366 toward the $13,184 operational cost of these stations.

Several major maintenance projects were completed during 1990-91.

- A cableway was reinstalled at the Tetagouche River site to improve the quality of high water discharge measurements. All bolts and fittings were spot welded to prevent vandalism.

- A new 3" intake pipe was installed at the Renous River station to replace the old 2 1/2" pipe which was badly corroded.

- A new orifice block was fabricated for the manometer at the station, Eel River at Dundee. The old block had been moved downstream during the spring freshet.

- Extensive damage was caused to the gauging shelter at Meduxnekeag River station by a falling tree. Several of the wall panels were replaced as well as most of the roof.

During the regular visitation to the surface water stations, recorder charts from eight Provincial groundwater wells were retrieved for data processing. The Province paid a total of $3,472 for data processing costs associated with production of records and the extra travel and overtime costs involved with three wells. The listing of the eight groundwater wells appears with the Schedule "A" listings in Appendix II.

The Water Survey of Canada staff at Fredericton maintained the operation of the three Bristol DCPs purchased on behalf of the Province. For the three DCPs an arrangement is in place whereby cost recovery in the amount of $2,582 is received from the Province annually as imputed rental.

W.S.C. staff continued to assist the Flood Forecast Centre during the spring operational period by interpreting flows during periods of ice and by ensuring that the real-time network was operational. The aging LaBarge D.C.P. at Salmon River was replaced by a Suttron 8200 to further upgrade the network. Several voice pagers were rented from N.B. Tel to improve communications with staff during the spring period.

The Network Evaluation and Planning Advisory Committee met several times to formulate recommendations to improve the hydrometric network. The major recommendation for the 91-92 season was the discontinuance of the gauging station at Bass River and the establishment of a new station in the Saint John area. A reconnaissance was conducted on 13 possible sites with Black River being identified as the most likely choice. The first edition of a newsletter entitled Network News was published to update data users on activities in the network and the products available. It is planned to publish this newsletter on an annual basis.

The office of the Water Resources Branch (WRB) of Environment Canada was moved to a new location in the city. The new facility offers many advantages over the old location, including under one roof storage of all equipment.

In February of 1991 new equipment was installed at the WRB office in Fredericton that significantly improved computing capabilities for the staff. Communications in the form of a 2400 baud Datapac 3000 service with 4 virtual circuits and an 8 port Gandalf MiniMux 2000 were installed. This equipment automatically links to the host system at Dartmouth N.S. and permits simultaneous use by four users or three users and a queued printer. In addition to improved access to the host system, a 386 PC and an additional printer were installed. This hardware provides the technical staff with standalone PC capability for wordprocessing, flow measurement computations and digital data conversion and screening.

As shown on page no. 16 the average cost of operating a gauging station for each year of the Agreement was compiled and adjusted to 1975-76 dollars, the first year of the Agreement, by setting the average cost for 1975-76 equal to 1.0. To compare the trend of average station costs to the National cost trend, seasonally adjusted quarterly inflation data by Statistics Canada were obtained. These quarterly values were used to calculate average national cost indices by fiscal year, all of which were brought back to 1975-76 dollars.

From the graphic that appears on page no. 17 it can be observed that increases in average station operating cost have not followed the National inflationary trends. Operating costs have been somewhat suppressed over the years which is an indication of the efficient manner of operating the network.

It should be noted however, that salaries of technical staff represent a major portion (roughly 70%) of the operating costs. Any significant change in salaries leads to a significant impact on the index for average station cost. In 1989-90 the index increased significantly over the previous year due to the intermin wage settlement for technical staff. With the upward adjustments in salaries due to the classification conversion of technical staff, the salary situation had to be addressed. To minimize the impact on the Province for 1990-91, the salary portion of operating costs was significantly adjusted to reflect the time spent on activities outside the Water Quantity Surveys Agreement. As a result the index for average station cost for 1990-91 remained about the same as 1989-90.

WATER QUANTITY SURVEYS

PROVINCE OF NEW BRUNSWICK

1990-91

OPERATIONAL COSTS FOR HYDROMETRIC SURVEYS

	Estimated	Actual
Personnel - Basic Pay - 01, 02, 03 (Salaries of hydrometric technical staff including overtime)	$225,800	239,361
Transportation and Communications		
Travel and Removal - 04	22,000	21,225
Transportation and Postage - 06	1,200	818
Telecommunications - 07	700	1,751
Professional and Special Services		
Professional Services - 11	2,500	612
Other Services - 15	3,500	4,283
Rentals		
Rentals - 16	2,000	3,023
Purchased Repair and Upkeep		
Equipment Purchased and Repairs - 17	4,500	6,819
Building and Structures Repairs - 18	1,000	760
Utilities, Materials and Supplies		
Public Utility Services - 19	3,500	3,061
Purchased Materials - 20	20,000	21,997
Parts and Consumable Tools - 21	9,000	7,618
Other Costs - Data Processing	10,000	10,172
- Depreciation of Vehicles	12,000	11,916
- Depreciation of Field Equipment and Instruments	15,000	9,040
TOTAL	$332,700	342,456

WATER QUANTITY SURVEYS

PROVINCE OF NEW BRUNSWICK

1990-91

OPERATIONAL COSTS FOR SEDIMENT SURVEYS

	Estimated	Actual
Personnel - Basic Pay - 01, 02, 03	$ NIL	0
Transportation and Communication		
Travel and Removal - 04	$ 500	0
Transportation and Postage - 06	100	0
Telecommunications - 07	NIL	0
Professional and Special Services		
Professional Services - 11	3,000	3,981
Other Purchased Services - 15	NIL	0
Purchased Repair and Upkeep		
Equipment Purchased and Repairs - 17	NIL	10
Building and Structure Repairs - 18	NIL	0
Utilities, Materials and Supplies		
Public Utility Services - 19	NIL	0
Purchased Materials - 20	200	36
Parts and Consumable Tools - 21	NIL	0
Other Costs - Sample Analysis	5,000	7,360
- Depreciation of Field Equipment and Instruments	1,300	1,797
TOTAL	$10,100	13,187

MAJOR MAINTENANCE PROJECTS
NEW BRUNSWICK
1990-91

STATION	PROJECT		COSTS	
Mamozekel River near Campbell River	Removal of discontinued stilling well station		Travel	$361
			Backhoe	557
		Total		$918
Iroquois River at Moulin Morneault	Construction of new station with shelter moved from Memozekel River *		Travel	$246
			Materials	35
		Total		$281
Eel River near Dundee	Reposition orifice block		Materials	$ 99
		Total		$ 99
Meduxnekeag River near Belleville	Removal of fallen tree and restoration of shelter		Travel	$104
			Labour	197
		Total		$301
Tetagouche River near Bathurst	Upgrade cableway		Travel	$231
			Materials	730
		Total		$961
Renous River at McGraw Brook	Replacement of intake pipe		Travel	$239
			Labour	48
			Rentals	530
			Materials	550
		Total		$1,367

*NBEPC provided post hole driller and labour

NOTE: All costs associated with these projects have been included with cost data shown on page no.5.

WATER QUANTITY SURVEYS

PROVINCE OF NEW BRUNSWICK

SUMMARY OF ANNUAL COSTS AND PAYMENTS RECEIVED - 1990-91

HYDROMETRIC SURVEYS

Number of Gauging Stations Operated - 83

41 Federal 26 Federal-Provincial 16 Provincial

Average Operational Cost of Gauging Station = $342,456/83 = $4,126

Actual Provincial Share of Operational Costs

(100% of 15* x $4,126) + (50% of 26 x $4,126) $115,528

Provincial Payment Received Per Schedule "D" $112,224

*Stations on French Lake and Lake Utopia are only operated for a six month season each.

SEDIMENT SURVEYS

Number of Sediment Stations Operated - 6

2 Federal 4 Federal-Provincial

Average Operational Cost of Sediment Station = $13,184/6 = $2,197

Actual Provincial Share of Operational Costs

50% of 4 x $2,197 $ 4,394

Provincial Payment Received per Schedule "D" $ 3,366

DATA PROCESSING FOR GROUNDWATER STATIONS

Processing Cost per Station per Year = $320

Number of Station Records Processed = 8

Extra Cost of Travel to Shippegan (2) and Lameque Stations - $1,200

Data Processing Cost = (8 x $320) + $1,200	$3,760
Provincial Payment Received per Schedule "D"	$3,760

DATA COLLECTION PLATFORMS

Annual Imputed Rental for Recovery of Costs (based upon $25,823 total purchase and recovery over a ten-year period)	$2,582
Provincial Payment Received per Schedule "D"	$2,582

TOTALS

Total Actual Provincial Shared Cost ($115,528 + 4,394 + 3,760+2,582)	$126,264
Total Provincial Payment Received ($112,224 + 3,366 + 3,760 + 2,582)	$121,932

Province/Territory: NEW BRUNSWICK

TABLE 1
WATER QUANTITY SURVEYS
GAUGING STATION DATA FOR 1990-91

No. of Stations			Changes during 1990-91		Stn. Designation April 1, 1990			
April 1 /89	April 1/90	Change	Added	Discontinued	Fed.	F P	Prov.	Contrib.
84	85	1	1	1	* 41 (2)	* 26 (4)	* 16	2

* Bracket Sediment Stations

TABLE 2
WATER QUANTITY SURVEYS
COMPARATIVE GAUGING STATION DATA April 1/75 - April 1/90

Federal Stations			F P Stations			Provincial Stations			Total Stations		
Apr 1 75	Apr 1 90	Chge	Apr 1 75	Apr 1 90	Chge	Apr 1 75	Apr 1 90	Chge	Apr 1/75	Apr 1/90	Chge
62	41	21	15	26	11	2	16	14	79	83	4

TABLE 3
WATER QUANTITY SURVEYS
DETAILED GAUGING STATION DATA 1990-91

F-1	F-2	F-3	F-4	Total F	FP-1	FP-2	FP-3	Total F/P	P-1	P-2	Total P	Contributed	Total-All
7	2	15	17 (2)	41 (2)	0	2	24 (4)	26 (4)	0	16	16	2	85 (6)

Bracket Sediment Stations in all catagories

Province: NEW BRUNSWICK

TABLE 4
WATER QUANTITY SURVEYS
TOTAL PROGRAM COSTS & SHAREABLE COSTS FOR 1990-91
(× $1000)

Total Program Costs					Shareable Costs						
P/Yrs	Sal.	Oper.	Cap.	Total	P/Yrs	Sal.	Oper.	Const.	Total	F Share	P Share
10.68	544.8	162.6	60.4	767.8	5.33	239.3	116.3	0.0	355.6	235.7	119.9

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TABLE 5
WATER QUANTITY SURVEYS
SUMMARY OF SCHEDULES D/F- 1990-91

Streamflow & Water Level		Sediment		Total
Operation	Construction	Operation	Construction	
112 224	0	3 366	0	115 590

TABLE 6
WATER QUANTITY SURVEYS
COMPARISON - SCHEDULED & ACTUAL COSTS FOR 1990-91
(Dollars)

Salary & Operations		Construction		Total			Annual Payment Received	Received Minus Actual
Sch. D/F	Actual Cost	Sch. D/F	Actual Cost	Sch. D/F	Actual Cost	Difference		
115 590	119 922	0	0	115 590	119 922	4 332	115 590	-4 332

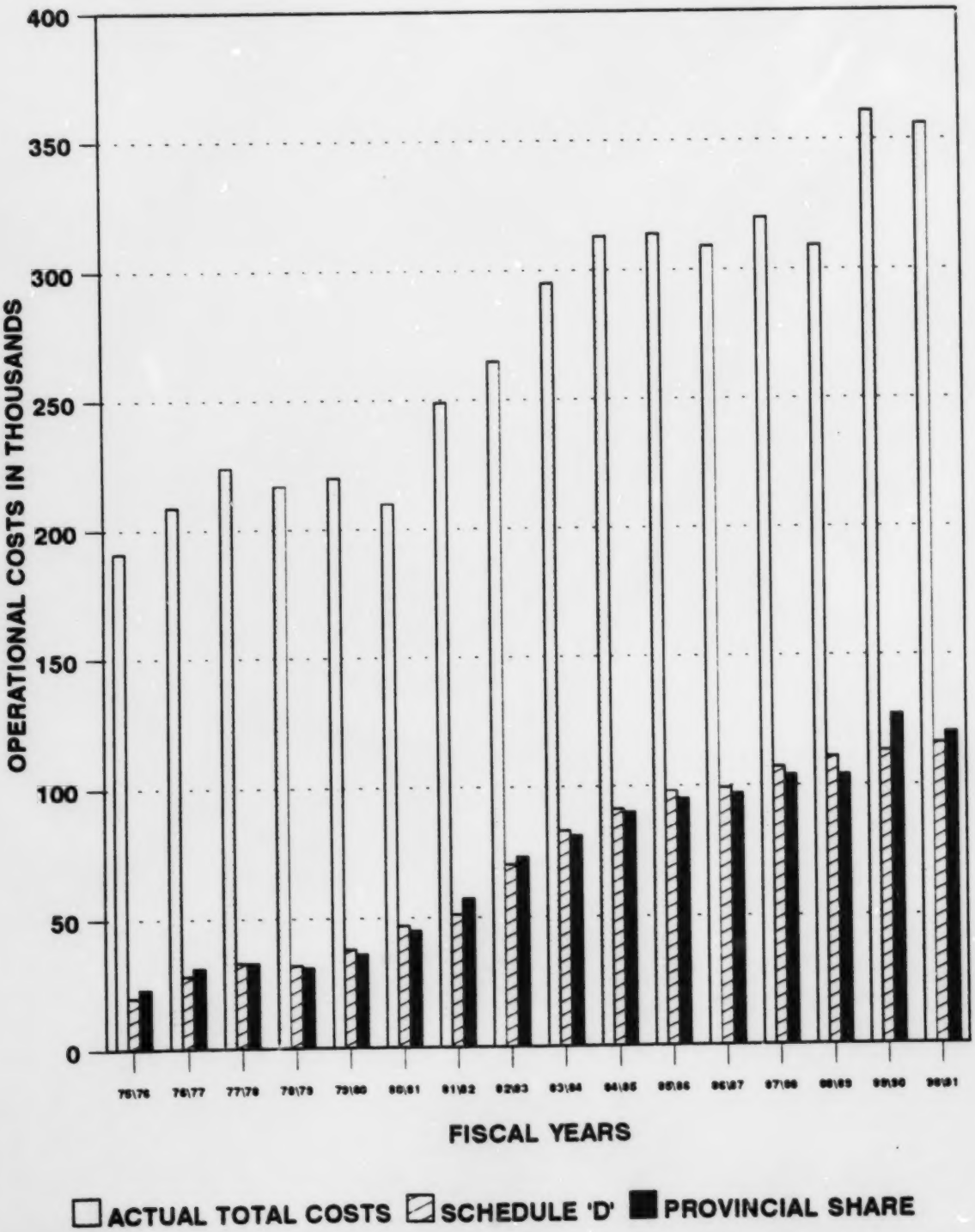
SUMMARY OF ANNUAL COSTS AND PAYMENTS

1975-76 TO 1990-91

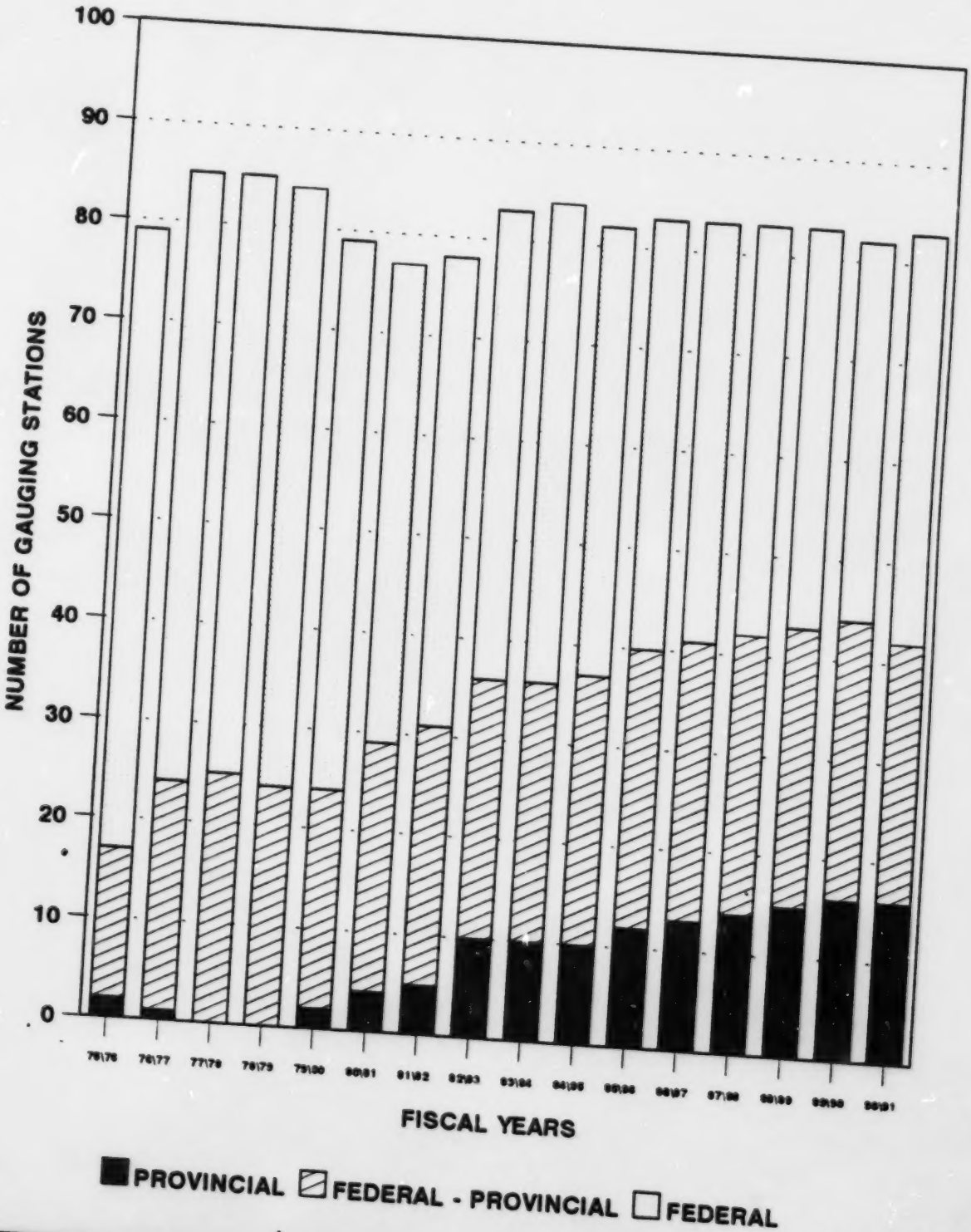
NEW BRUNSWICK

	SCHEDULE "D"				ACTUAL PROVINCIAL SHARE				
YEAR	HYDROMET	SEDIMENT	CONSTR	TOTAL	HYDROMET	SEDIMENT	CONSTR	TOTAL	+CREDIT/DEBIT-
1975-76	20,000	-	6,000	26,000	23,009	-	5,815	28,824	-2,824
1976-77	27,750	-	-	27,750	30,725	-	-	30,725	-2,975
1977-78	33,090	-	-	33,090	32,925	-	-	32,925	+165
1978-79	32,376	-	-	32,376	30,984	-	-	30,984	+1,392
1979-80	37,869	-	-	37,869	36,153	-	-	36,153	+1,716
1980-81	46,827	-	-	46,827	44,996	-	-	44,996	+1,831
1981-82	51,390	-	-	51,390	57,456	-	-	57,456	-6,066
1982-83	70,334	-	-	70,334	73,416	-	-	73,416	-3,082
1983-84	83,319	-	-	83,319	80,684	-	-	80,684	+2,635
1984-85	87,185	3,386	-	90,571	86,692	3,426	-	90,118	453
1985-86	93,925	3,700	-	97,625	90,875	3,976	-	94,851	+2,774
1986-87	95,576	3,900	-	99,476	94,068	2,836	-	96,904	+2,572
1987-88	102,762	4,100	-	106,862	101,412	2,732	-	104,144	+2,718
1988-89	107,072	3,634	-	110,706	100,660	3,614	-	104,274	+6,432
1989-90	109,823	3,566	-	113,389	123,714	3,748	1,321	128,783	-15,394
1990-91	112,224	3,366	-	115,590	115,528	4,394	-	119,922	- 4,332
							NET		-11,985

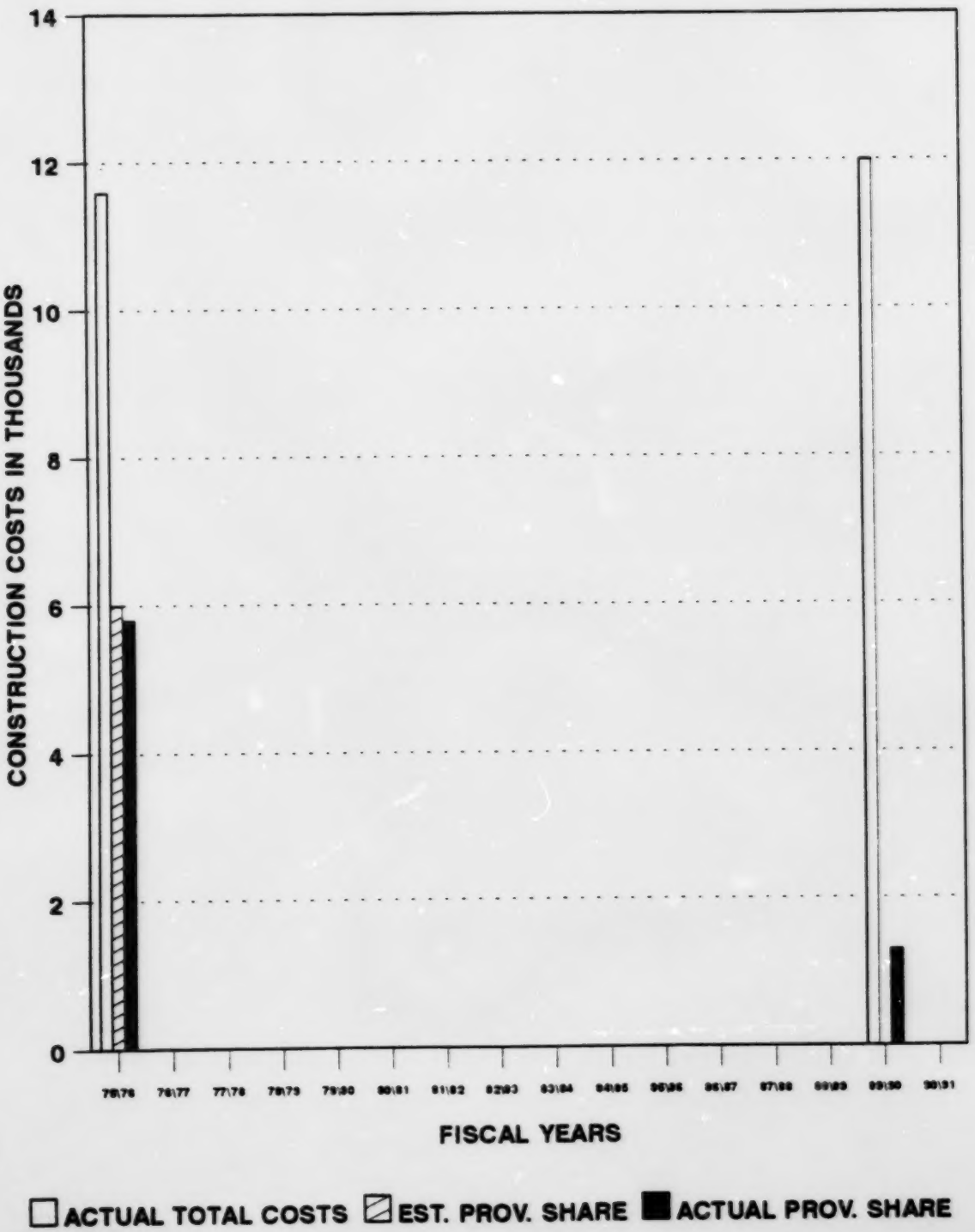
WATER QUANTITY SURVEYS
NEW BRUNSWICK
OPERATIONAL COSTS



WATER QUANTITY SURVEYS
NEW BRUNSWICK
GAUGING STATIONS OPERATED



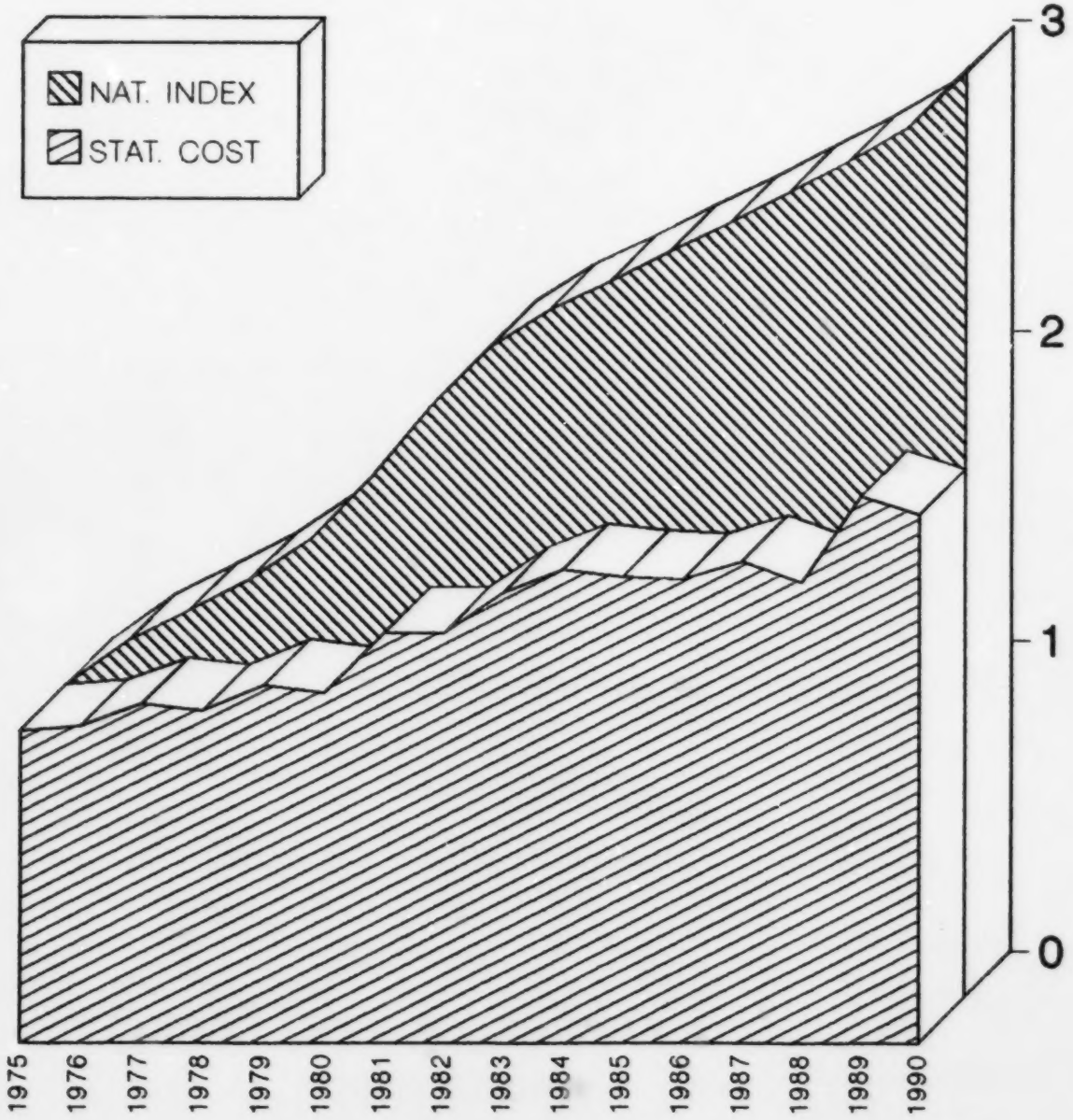
WATER QUANTITY SURVEYS
NEW BRUNSWICK
CONSTRUCTION COSTS



NEW BRUNSWICK
COMPARISON OF AVERAGE STATION OPERATING COST
TO NATIONAL COST TREND

Year	No. Stations	Average Station Cost ($)	Station Cost Index Using 1975-76 Dollars	Modified National Cost Index Using 1975-76 Dollars
1975-76	79	2422	1.00	1.00
1976-77	85	2458	1.02	1.14
1977-78	85	2634	1.09	1.24
1978-79	84	2582	1.07	1.34
1979-80	79	2781	1.15	1.47
1980-81	77	2727	1.13	1.67
1981-82	78	3192	1.32	1.90
1982-83	83	3192	1.32	2.09
1983-84	84	3508	1.45	2.21
1984-85	82	3689	1.52	2.30
1985-86	83	3635	1.50	2.40
1986-87	83	3618	1.49	2.49
1987-88	83	3756	1.55	2.59
1988-89	83	3595	1.48	2.69
1989-90	82	4266	1.76	2.80
1990-91	83	4126	1.70	2.98

COST TREND ANALYSIS
STATION COST vs NATIONAL COST INDEX
NEW BRUNSWICK



1975 BASE VALUE OF 1.0

APPENDIX I

MEMORANDUM OF AGREEMENT

(Sample only)

MEMORANDUM OF AGREEMENT made this twenty-fourth day of February, 1975,

BETWEEN:

The Government of Canada, hereinafter called "Canada", represented by the Minister of the Environment

OF THE FIRST PART

- and -

The Government of the Province of New Brunswick, hereinafter called the "Province" represented by the member of the Executive Council for Environment

OF THE SECOND PART

WHEREAS co-operative water quantity surveys have been carried on for many years under various informal federal-provincial agreements in the Provinces of Canada by the Water Survey of Canada of the Department of the Environment, for the purpose of securing co-ordinated and standardized basic data to facilitate resource planning and management in general and the design and implementation of projects related to navigation, hydro-electric development, irrigation, drainage, flood control, recreation, domestic and industrial water supply and other purposes;

AND WHEREAS the Governor-in-Council has by Order-in-Council NO. PC 1975-1/172 dated January 28, 1975, authorized the Minister of Environment to execute this agreement on behalf of Canada, subject to funds being voted by the Parliament of Canada;

AND WHEREAS the Lieutenant Governor in Council has, by Order-in-Council No. 75-138 dated February 26, 1975, authorized the Minister of the Environment to execute this agreement on behalf of the Province subject to funds being voted by the Legislative Assembly.

NOW THEREFORE this agreement witnesseth that water quantity surveys in the Province and the financing thereof shall be continued and maintained upon the following basis; -

INTRODUCTION

DEFINITIONS

a) **ANNUAL PAYMENT** - a sum, agreed to by both parties in advance of the fiscal year, which shall represent the costs of operation and construction of water quantity survey stations.

b) **CONSTRUCTION** - includes the construction of new water quantity survey stations and the maintenance, repair and reconstruction of existing water quantity survey stations.

c) **CONSTRUCTION PERSONNEL** - includes foremen and labourers on full time duty as well as engineering and technical staff on part time supervisory duty or reconnaissance assignment.

d) **FIELD PERSONNEL** - includes hydrometric supervisors and field technicians on full time duty as well as engineering and technical staff on temporary assignment.

e) **NETWORKS** - an original system of gauging stations for collection of water quantity survey data.

f) **OPERATING PARTY** - either party to this agreement which operates water quantity survey data.

g) **PUBLISHED DATA** - includes streamflow, water level and sediment data. The data is to be available in publications and computer compatible data files.

h) **SEDIMENT STATIONS** - any location where surveys are undertaken to collect data on suspended sediment or bed material or bed load data singly or in combination. Water temperature data is to be collected.

i) **WATER QUANTITY SURVEY STATIONS** - any location where surveys are undertaken to collect streamflow or water level or suspended sediment or bed material or bed load data singly or in combination. Water temperature data may be collected.

OPERATIONAL CONSIDERATIONS

ARTICLE I

Each water quantity survey station presently in operation has been identified according to the designation federal, federal-provincial or provincial. The current designation is given in Schedule A, hereto attached. Schedule A may be revised to include a change in the designation of a station, the addition of new stations or the deletion of stations as agreed by the Co-ordinating Committee (Article XII) and approved by the officials named in Article XIII.

ARTICLE II

Canada will construct and operate and pay the cost of construction and the annual cost of operation of water quantity survey stations which have been designated as federal. Where Canada deems it desirable in the interest of efficiency of operation, the Province may be requested to construct and operate some federal water quantity survey stations. If the Province agrees to such arrangements, Canada would in such cases reimburse the Province for the cost of construction and annual cost of operation in accordance with Article VI.

ARTICLE III

Where Canada constructs and operates water quantity survey stations designated as federal-provincial, the Province will reimburse Canada for 50% of the construction costs and 50% of the annual cost of operation. Where the Province constructs and operates these stations, Canada will reimburse the Province for 50% of the construction costs and 50% of the annual cost of operation in accordance with Article VI.

ARTICLE IV

If requested by the Province, Canada will construct and operate water quantity survey stations designated as provincial provided the Province reimburses Canada for 100% of the construction cost and annual cost of operation. If the Province constructs and operates these stations the Province will assume 100% of the annual cost of construction and operation in accordance with Article VI.

ARTICLE V

a) The operating party shall provide the staff to meet its responsibilities under this agreement.

b) Canada will at its own expense publish data from stations that it operates. Canada will on request at its own expense, publish data from stations operated by the Province providing the data meets national standards.

c) Water quantity surveys under this agreement shall be carried out to national standards in field procedures, equipment and instrumentation, data compilation and will use national guidelines for station designations. Such standards and guidelines shall be developed and maintained by Canada in consultation with all of the Provinces.

d) Canada and the Province shall work together to take advantage of technological advancements which improve the quality of data and the efficiency of standard procedures and to develop methods and techniques to assist in planning water quantity survey networks.

e) Canada at its own expense will provide calibration service for water quantity survey velocity instruments for both parties.

FINANCIAL CONSIDERATIONS

ARTICLE VI

a) Procedures for computing the annual payment are given in Schedule C.

b) The annual payment for 1975-76 is set out in Schedule D. The annual payment for subsequent years shall be determined according to the terms of this agreement and the procedures as set out in Schedule C.

c) Annual operation costs, except for sediment stations, will be computed using average annual water quantity survey station costs and the number of stations to be operated. The average annual water quantity survey station costs shall be recomputed annually according to the items listed in Schedule B.

d) Annual construction costs, except for sediment stations, will be the cost of constructing new water quantity survey stations plus repairs to and major reconstruction of existing water quantity survey stations.

e) The annual operation costs for sediment stations will be the summation of the individual station operation costs.

f) The annual construction costs of sediment stations will be the cost of constructing new sediment stations plus repairs to and major reconstruction of existing stations.

ARTICLE VII

a) The party operating the water quantity survey stations in accordance with Articles II, III and IV, will be responsible for providing and paying the total cost of water level recording equipment.

b) All costs associated with the purchase, installation and operation of specialized water quantity survey equipment will be paid for by the party or parties requiring the service.

ARTICLE VIII

Canada or the Province, depending on the operating responsibilities, shall submit invoices for one-quarter of the annual payment on July 1st., October 1st., January 1st. and March 1st. of each fiscal year in accordance with the annual payment set out in Schedule D. Payment is to be made as soon as possible after receipt of each quarterly claim but in no case later than March 31st. of each year.

ARTICLE IX

Except as agreed by the parties hereto where both parties have an interest, either operational or financial, the annual net change in the total number of water quantity survey stations, including federal, federal-provincial and provincial, as set out in Schedule A, is not to exceed 6% in any year.

ARTICLE X

Each party constructing or operating a water quantity survey station or stations shall keep complete records of all shareable expenditures made pursuant to this agreement and shall support such expenditures with proper documentation. Canada and the Province upon request shall make these records and documents available to auditors appointed by each other.

CO-OPERATION

ARTICLE XI

There shall be a free exchange of water quantity survey data between Canada and the Province. The party operating the water quantity survey station shall retain originals or a microfilm copy of observations, measurements, recorder charts and computations and these are to be available to the the other party on request.

CO-ORDINATION

ARTICLE XII

The officials named in Article XIII shall establish a Co-ordinating Committee representing each of the parties affected by this agreement. The Co-ordinating Committee shall be responsible for:

a) Planning and the continuing review of water quantity survey networks, including addition and deletion of all stations within Provincial boundaries.

b) Determining and reviewing the designation of water quantity survey stations using national guidelines which may from time to time be changed, subject to ratification by Canada and all of the Provinces.

c) Assuring the maintenance of standards in procedures, data compilation and instrumentation.

d) Reviewing annual operating costs and establishing average annual station costs, as per Article VI, for revision of Schedule D.

e) Preparation annually of new Schedule A and D which with the approval of the officials named in Article XIII would apply for the second and each subsequent year of the agreement.

The committee shall meet at least once a year and shall report to the officials named in Article XIII.

ADMINISTRATIVE ARRANGEMENTS

ARTICLE XIII

This agreement is to be administered for Canada by the Regional Director of the Inland Waters Directorate located at Halifax, Nova Scotia, and for the Province by the Assistant Deputy Minister (Environment), located at Fredericton, New Brunswick.

IMPLEMENTATION

ARTICLE XIV

The parties hereto agree that water quantity surveys will be carried out at indicated in Article I to XIII inclusive and the Schedules attached hereto.

PERIOD OF AGREEMENT

ARTICLE XV

This agreement shall become effective and binding on the parties upon the first day of April, 1975.

The agreement may be terminated by Canada or the Province on March 31st of any year provided that eighteen (18) months notice in writing is given. The agreement may be revised with the consent of the Governor-in-Council and the Lieutenant Governor-in-Council.

IN WITNESS WHEREOF the Honourable Jeanne Sauve, Minister of Environment has hereunto set her hand on behalf of Canada, and the Honourable Fernand G. Dube', Q.C., Member of the Executive Council for Environment has hereunto set his hand on behalf of the Province of New Brunswick.

Signed on behalf of Canada)
by the Honourable Jeanne Sauve)
Minister of Environment)..........

IN THE PRESENCE OF)

.....)

Signed on behalf of the Province of)
New Brunswick by the Honourable)
Fernand G. Dube, Q.C., Member of the)..........
Executive Council for Environment)

IN THE PRESENCE OF)

)
)
.....

APPENDIX II

SCHEDULE A

WATER QUANTITY SURVEY STATIONS

SCHEDULE "A" RESPONSIBILITY CLASSIFICATION NEW BRUNSWICK
1990-91

FEDERAL 1 FEDERAL DEPARTMENTAL PROGRAMS

STA. NO.	STATION NAME	ESTAB.	D.A.	RECORDS	REMARKS
01BP002	CATAMARAN BROOK AT REPAP ROAD BRIDGE	1989	28.7	Q R C	DCP MET
01AL003	HAYDEN BROOK NEAR NARROWS MOUNTAIN	1970	6.48	Q R C	
01AP004	KENNEBECASIS RIVER AT APOHAQUI	1961	1100	Q R C	TMK WQ ICE SS
01AL004	NARROWS MOUNTAIN BROOK NEAR NARROWS MOUNTAIN	1972	3.89	Q R C	DCP MET
01AP006	NEREPIS RIVER NEAR FOWLERS CORNER	1976	293	Q R C	SS
01BV006	POINT WOLFE RIVER AT FUNDY NATIONAL PARK	1964	130	Q R C	DCP LRTAP SS
01AP005	SAINT JOHN RIVER AT SAINT JOHN	1966		H R C	TMK REG

FEDERAL 2 INTERPROVINCIAL WATERS

STA. No.	STATION NAME	ESTAB.	D.A.	RECORDS	REMARKS
01AF003	GREEN RIVER NEAR RIVIERE-VERTE	1962	1150	Q R C	TMK REG ICE WQ2
01BC001	RESTIGOUCHE RIVER BELOW KEDGWICK RIVER	1962	3160	Q R C	ICE SS

FEDERAL 3 INTERNATIONAL WATERS

STA. NO.	STATION NAME	ESTAB.	D.A.	RECORDS	REMARKS
01AG003	AROOSTOOK RIVER NEAR TINKER	1975	6060	Q R C	TMK REG WQ2
01AJ004	BIG PRESQUE ISLE STREAM AT TRACEY MILLS	1967	484	Q R C	TMK REG ICE WQ2
01AE001	FISH RIVER NEAR FORT KENT	1929	2260	Q R C	TMK
01AR011	FOREST CITY STREAM BELOW FOREST CITY DAM	1969	357	Q R C	REG
01AR009	GRAND FALLS FLOWAGE AT GRAND FALLS	1980		H R C	REG WQ2
01AR013	GRAND LAKE AT FOREST CITY	1969		H R C	REG
01AG002	LIMESTONE STREAM AT FOUR FALLS	1967	199	Q R C	TMK WQ2
01AJ003	MEDUXNEKEAG RIVER NEAR BELLEVILLE	1967	1210	Q R C	TMK ICE WQ2
01AD004	SAINT JOHN RIVER AT EDMUNDSTON	1968		H R C	TMK WQ2
01AD002	SAINT JOHN RIVER AT FORT KENT	1926	14700	Q R C	DCP ICE WQ2
01AF002	SAINT JOHN RIVER AT GRAND FALLS	1930	21900	Q R C	TMK REG30 WQ
01AR010	SPEDNIC LAKE AT ST. CROIX	1967		H R C	REG
01AR005	ST. CROIX RIVER AT BARING	1959	3550	Q R C	DCP REG
01AR004	ST. CROIX RIVER AT VANCEBORO	1928	1080	Q R C	REG
01AD003	ST. FRANCIS RIVER AT OUTLET OF GLASIER LAKE	1951	1350	Q R C	DCP SS WQ2

SCHEDULE "A" RESPONSIBILITY CLASSIFICATION NEW BRUNSWICK
1990-91

FEDERAL 4 NATIONAL WATER QUANTITY INVENTORY

STA. NO.	STATION NAME	ESTAB.	D.A.	RECORDS	REMARKS
01BK001	BASS RIVER AT BASS RIVER	1965	175	Q R C	
01BL003	BIG TRACADIE RIVER AT MURCHY BRIDGE CROSSING	1970	383	Q R C	DCP
01BS001	COAL BRANCH RIVER AT BEERSVILLE	1964	166	Q R C	SED
01AR006	DENNIS STREAM NEAR ST. STEPHEN	1966	115	Q R C	REG80 SED
01BJ003	JACQUET RIVER NEAR DURHAM CENTRE	1964	510	Q R C	
01BR001	KOUCHIBOUGUAC RIVER NEAR VAUTOUR	1969	177	Q R C	
01AQ001	LEPREAU RIVER AT LEPREAU	1918	239	Q R C	TLG TYP LRTAP
01AQ002	MAGAGUADAVIC RIVER AT ELMCROFT	1943	1420	Q R C	REG78
01BU002	PETITCODIAC RIVER NEAR PETITCODIAC	1961	391	Q R C	WQ ICE
01BJ007	RESTIGOUCHE RIVER ABOVE RAFTING GROUND BROOK	1968	7740	Q R C	WQ TMK DCP ICE MET
01BL002	RIVIERE CARAQUET AT BURNSVILLE	1969	173	Q R C	
01AK003	SAINT JOHN RIVER AT FREDERICTON	1929		H R C	TMK REG TLG
01AK004	SAINT JOHN RIVER BELOW MACTAQUAC	1966	39900	Q R C	TMK REG TLG
01AJ001	SAINT JOHN RIVER NEAR EAST FLORENCEVILLE	1951	34200	Q R C	TMK REG
01BO001	SOUTHWEST MIRAMICHI RIVER AT BLACKVILLE	1961	5050	Q R C	TMK TYP WQ SED ICE
01BJ001	TETAGOUCHE RIVER NEAR BATHURST	1951	363	Q R C	
01BE001	UPSALQUITCH RIVER AT UPSALQUITCH	1943	2270	Q R C	TYP DCP ICE SS MET

SCHEDULE "A" RESPONSIBILITY CLASSIFICATION NEW BRUNSWICK 1990-91

FEDERAL-PROVINCIAL 2 RIVER BASIN MANAGEMENT

STA. NO.	STATION NAME	ESTAB.	D.A.	RECORDS	REMARKS
01AR012	CHAMCOOK STREAM AT LITTLE CHAMCOOK LAKE OUTLET	1968		Q R C	2 OUTLETS @ H.W.
01AJ008	SAINT JOHN RIVER AT HARTLAND SALMON POOL	1973		H R C	TMK REG

FEDERAL-PROVINCIAL 3 REGIONAL WATER QUANTITY INVENTORY

STA. NO.	STATION NAME	ESTAB.	D.A.	RECORDS	REMARKS
01BO003	BARNABY RIVER BELOW SEMIWAGAN RIVER	1973	484	Q R C	
01BO004	BARTIBOG RIVER BELOW HIGHWAY NO. 8	1978	316	Q R C	
01AJ010	BECAGUIMEC STREAM AT COLDSTREAM	1973	350	Q R C	TMK ICE SED
01AO009	BURPEE MILLSTREAM NEAR FERNMOUNT	1976	93.2	Q R C	
01AP002	CANAAN RIVER AT EAST CANAAN	1962	668	Q R C	TMK TYP ICE
01AN001	CASTAWAY STREAM NEAR CASTAWAY	1972	34.4	Q R C	
01AJ011	COLD STREAM AT COLDSTREAM	1973	156	Q R C	TMK
01BJ012	EEL RIVER NEAR DUNDEE	1983	43.2	Q R C	
01AK008	EEL RIVER NEAR SCOTT SIDING	1974	531	Q R C	TMK ICE
01AF007	GRANDE RIVIERE AT VIOLETTE BRIDGE	1977	339	Q R C	DCP SED ICE
01BT001	KINNEAR RIVER NEAR HAUTE-ABOUJAGANE	1985	32.1	Q R C	
01BP001	LITTLE SOUTHWEST MIRAMICHI RIVER AT LYTTLETON	1952	1340	Q R C	
01AH005	MAMOZEKEL RIVER NEAR CAMPBELL RIVER	1972	230	Q R C	
01AK006	MIDDLE BRANCH NASHWAAKSIS STREAM AT SANDWITH'S FARM	1966	5.70	Q R C	
01AK005	MIDDLE BRANCH NASHWAAKSIS STREAM NEAR ROYAL ROAD	1965	26.9	Q R C	
01AK007	NACKAWIC STREAM NEAR TEMPERANCE VALE	1967	240	Q R C	TMK
01AL002	NASHWAAK RIVER AT DURHAM BRIDGE	1962	1450	Q R C	TMK ICE SS SED
01BQ001	NORTHWEST MIRAMICHI RIVER AT TROUT BROOK	1962	948	Q R C	WQ DCP
01AM001	NORTH BRANCH OROMOCTO RIVER AT TRACY	1962	557	Q R C	TMK LRTAP ICE SS
01AP009	PARLEE BROOK BELOW ARNOLD BRIDGE	1989	35.4	Q R C	MET TLG
01AQ008	PISKAHEGAN STREAM NEAR PLEASANT MOUNTAIN	1982	197	Q R C	
01BO002	RENOUS RIVER,AT MCGRAW BROOK	1965	611	Q R C	
01AN002	SALMON RIVER AT CASTAWAY	1974	1050	Q R C	TLG LRTAP SS MET
01AK001	SHOGOMOC STREAM NEAR TRANS CANADA HIGHWAY	1943	234	Q R C	DCP TYP SS

PROVINCIAL 2 SPECIFIC PURPOSE MONITORING REQUIREMENTS

STA. NO.	STATION NAME	ESTAB.	D.A.	RECORDS	REMARKS
01AO010	FRENCH LAKE AT LAKEVILLE CORNER	1980		H R S	TMK REG
01AO003	GRAND LAKE AT NEWCASTLE CREEK	1965		H R C	TMK REG
01AO004	JEMSEG RIVER AT JEMSEG	1966		H R C	TMK REG
01AQ009	LAKE UTOPIA AT CANAL	1985		H R S	REG
01AQ007	MAGAGUADAVIC LAKE NEAR UPPER MAGAGUADAVIC	1978		H R C	REG78
01BJ010	MIDDLE RIVER NEAR BATHURST	1981	190	Q R C	
01AL008	NASHWAAK RIVER AT STANLEY	1982	641	Q R C	TMK
01BJ011	NIGADOO RIVER NEAR ALCIDA	1981	123	Q R C	
01AK009	SAINT JOHN RIVER AT MACTAQUAC GENERATING STATION	1980		H R C	REG
01AO002	SAINT JOHN RIVER AT MAUGERVILLE	1978		H R C	TMK REG
01AP003	SAINT JOHN RIVER AT OAK POINT	1923		H R C	TMK REG
01AJ009	SAINT JOHN RIVER AT SIMONDS	1974		H R C	REG TMK
01AH003	TOBIQUE RIVER AT PLASTER ROCK	1954	3130	Q R C	TMK REG54 ICE
01AH002	TOBIQUE RIVER AT RILEY BROOK	1954	2230	Q R C	TMK REG54 ICE
01BU003	TURTLE CREEK AT TURTLE CREEK	1962	129	Q R C	
01BJ009	WALKER BROOK AT CAMBELLTON	1980	60.8	Q R C	REG

CONTRIBUTED STATIONS

NEW BRUNSWICK
1990-91

STA. NO.	STATION NAME	ESTA.	D.A.	AGENCY	REMARKS
01BK003	NEPISIGUIT RIVER AT NEPISIGUIT FALLS	1921	1840	CON-BATH	REG WQ
01AH004	TOBIQUE RIVER AT NARROWS	1953	4330	NBEPC	REG54

PROVINCIAL GROUNDWATER STATIONS
FOR WHICH DATA PROCESSING CHARGES ARE RECOVERABLE
NEW BRUNSWICK
1990-91

Station Number	Name
91BL008	Caraquet GW
91AF001	St. Basile No. 1 GW
91AF002	St. Basile No. 2 GW
91BJ001	Charlo GW
91BL009	Tracadie GW
91BL010	Shippegan Site De Reservoir GW
91BL011	Lameque Rue Bes Des Pecheurs GW
91BL012	Shippegan Rue 15 St. GW

EXPLANATION OF SYMBOLS & ABBREVIATIONS

TYPE OF RECORD

H _ water level data

Q - flow data

TYPE OF GAUGE

M - manual gauge

R - automatic recording gauge

OPERATION SCHEDULE

C - continuous record

M - miscellaneous record

S - seasonal record

REMARKS

DCP - data collection platform

ICE - ice thickness surveys

LRTAP - samples collected for acid precipitation monitoring

MET - data available from meteorological sensors

REG - regulated flow

REG78 - regulated flow since 1978

RMT - remote station accessed by aircraft

SED - sediment data currently being collected

SS - snow survey data

TLG - telephone interogated data logger

TMK - telephone interogated telemark

TYP - typical stream; data used to produce statement on runoff conditions

WQ - samples collected for water quality national overview network

WQ2 - intense sampling program for water quality

NATIONAL GUIDELINES FOR DESIGNATION

WATER QUANTITY SURVEY STATIONS

October 20, 1982

NATIONAL GUIDELINES FOR DESIGNATING WATER QUANTITY SURVEY STATIONS

These national guidelines of the Federal-Provincial Memoranda of Agreement for Water Quantity Surveys have been prepared by Canada in consultation with the Provinces for the purpose of designating federal, federal-provincial and provincial water quantity survey stations. In compliance with the agreements, the assignment and review of station designations is the responsibility of each Co-ordinating Committee.

The intent of these guidelines is to provide a uniform and consistent manner for designating water quantity survey stations throughout Canada. In these guidelines, "water quantity survey stations" have the same definition as in the Memoranda of Agreement and include water level, streamflow and sediment survey stations. The word "station" in these guidelines means "water quantity survey stations". Where not otherwise specified the word "Province" means "Province" or "Territory". The designation of each sediment station can be considered separately from the corresponding water quantity survey station designation.

FEDERAL STATIONS

There are stations that support programs of primary interest to the Government of Canada. These stations are funded 100 per cent by Canada in accordance with Article II and the procedures described in Schedules B, C, and D (F for the Yukon) (and Schedules E,D, and F for Quebec) of the Memoranda of Agreement.

1. Federal Department Programs

These are stations required under statutory obligations that have developed in response to federal legislation and priorities, and as a result of programs of various federal government departments or agencies to provide quantity information on inland waters. These include stations operated in support of specific federal works, benchmark basins, studies or investigations, research projects, and to meet navigational requirements and management responsibilities. A station may be so designated where Canada has formally accepted responsibility for the continued operation of the station under an implementation agreement.

2. Interprovincial Rivers

These are stations required for monitoring of waters flowing across or forming part of provincial or territorial boundaries where federal responsibility has been established by an agreement or where justified by an inter-jurisdictional concern.

3. International Waters

These are stations associated with federal responsibilities arising from international agreements, treaties, orders or studies. These include:

a) Stations specifically named under the Boundary Waters Treaty and those approved officially as "International Gauging Stations".

b) Stations specifically stipulated under IJC orders, or required to support such orders; to provide for control of waters crossing or forming part of the international boundary and for IJC related study, surveillance, flow regulation or appointment purposes. Such stations may also be required for similar studies carried out under unilateral or bilateral mechanisms and undertaken in anticipation of the need for formal orders.

c) Stations related to international treaties and agreements which involve waters crossing or forming part of the international boundary and which specifically stipulate the reaches of streams required to be monitored or special arrangements that need to be made to meet water quantity survey needs.

d) Stations on streams flowing across or forming part of the international boundary for which Canada has determined that monitoring is required for water management purposes.

4. National Water Quantity Inventory

These are stations that provide information for a national inventory of surface waters. They consist of those stations required to determine water quantity trends in the major drainage basins in Canada that serve to provide an assessment of the total surface water resources and to measure significant discharge to the oceans.

FEDERAL-PROVINCIAL AND/OR FEDERAL-TERRITORIAL STATIONS

These are stations that support programs of joint interest to Canada and the Province. The construction and operation of these stations are funded in accordance with Article III and procedures described in Schedules B, C, and D (F for the Yukon) (and Schedules E, D and F for Quebec) of the Memoranda of Agreement.

1. Federal-Provincial Agreement

These are stations where joint federal and provincial (or territorial) responsibility is established under the terms and conditions of an agreement between Canada and one or more Province or Territories.

The joint funding arrangements for any particular agreement must be taken into consideration before designating a station in order to ensure the intended division of financial responsibility. Following the completion of federal-provincial water study, a station may be designated in this category only if its continuation would be in the joint interest of Canada and the Province.

2. River Basin Management

These are stations where both Canada and the Province have stated an interest in the need for information to support the management of the water resources of a river basin.

3. Regional Water Quantity Inventory

These are stations that provide an assessment of the quantity of water resources available in distinct hydrologic zones within each Province through representative sampling taking into consideration climatic variability, geographic and geologic differences, levels of population and development, basin size, streamflow regime, relationship to major groundwater resources and length of record.

PROVINCIAL AND/OR TERRITORIAL STATIONS

These are stations that support programs of primary interest to a Province. They are funded 100 per cent by the Province in accordance with Article IV and procedures described in Schedules B, C, and D (F for the Yukon) (and Schedules E, D, and F for Quebec) of the Memoranda of Agreement.

1. Provincial Department Programs

These are stations required strictly for provincial programs where water quantity information on inland waters is needed.

2. Specific Purpose Monitoring Requirements

These are stations established as a result of specific requests of provincial/territorial agencies, municipalities, or non-government organizations. All such requests shall be referred to the Province for screening and funding arrangements before being presented to the applicable Co-ordinating Committee.

CRITERIA FOR DESIGNATING STATIONS

UNDER GUIDELINE FEDERAL 4

NATIONAL WATER QUANTITY INVENTORY

1. Stations established on the main stem of large rivers discharging directly to the oceans as defined in the Hydrologic Atlas of Canada as those whose mean annual flow at the outlet of the river basin exceeds 400 m^3/sec.

2. Stations established on rivers for the purpose of determining water quantity trends or those located on rivers contributing discharge to the oceans whose mean annual flow at the mouth of the river is at least 85 m^3/sec.

3. Stations established for the purpose defined above whose drainage areas are greater than 200 km^2.

4. Stations of drainage area less than 200 km^2 may be established on rivers to determine discharge to the ocean and/or to assess the total water resource available in major hydrologic and climatic zones which are defined as follows:

   Island Provinces - P.E.I. and Newfoundland,
   Islands forming integral parts of Provinces/Territories,
   Major Peninsulas
   Distinctly identified hydrologic and/or climatic zones.

   The density of such stations shall be limited to those determined by official scientifically conducted station network analysis as required to determine the desired hydrologic parameters of the major geographical zones within the Province, Territory or Region.

APPENDIX IV

SCHEDULE B

ANNUAL PAYMENTS - ITEMS TO BE INCLUDED

SCHEDULE B

ANNUAL PAYMENTS - ITEMS TO BE INCLUDED

The items to be included in computing the annual payments of water quantity survey stations are:

I. OPERATIONAL COSTS WATER QUANTITY SURVEY STATIONS EXCLUDING SEDIMENT

a) Salaries and overtime of field personnel and casual labour;

b) Field travel expenses, board and lodging costs for field personnel;

c) The computer costs associated with computing daily mean hydrometric data;

d) Observer pay;

e) Depreciation, operation and maintenance of vehicles and boats;

f) Maintenance of gauging station structures including material and labour for minor repairs;

g) Maintenance and depreciation of all field equipment and instruments (except as noted in Article VII of this agreement);

h) Fuels such as propane for heating recorder installations and gas such as nitrogen for operating pressure sensing equipment, electricity charges;

i) Rental of aircraft, vehicles, boats, etc., supplied by either party or chartered;

j) The annual cost of land leases;

k) Services, e.g. cost of establishing gas caches, operation of line cabins, etc.

II. OPERATIONAL COSTS SEDIMENT STATIONS

All items in I OPERATIONAL COST plus:

1) The computer costs associated with computing daily mean sediment data;

2) Cost of analysis of sediment samples.

SCHEDULE B (cont'd)

III. NEW CONSTRUCTION REPAIR AND MAJOR RECONSTRUCTION COSTS FOR WATER QUANTITY SURVEY STATONS:

a) Salaries and overtime of construction personnel;

b) Field travel expenses, board and lodging costs of construction personnel;

c) Depreciation, operation and maintenance of vehicles;

d) Construction materials;

e) Maintenance, depreciation and operation of construction equipment;

f) Rental of aircraft, vehicles, boats, construction equipment, etc. supplied by either party or chartered;

g) Land acquisition costs including legal survey costs;

h) Construction contract payments.

APPENDIX V

PROCEDURE FOR

APPLICATION OF SCHEDULE B TO THE

ATLANTIC REGION AGREEMENTS

PROCEDURE FOR

APPLICATION OF SCHEDULE B TO THE

ATLANTIC REGION AGREEMENTS

The procedures used by Water Resources Branch, Atlantic Region, to determine operational costs under the Water Quantity Surveys Cost Sharing Agreements are based on the financial system called AFMAS. Under the Departmental coding structure, costs are divided into various object groups (01 to 25) and coded accordingly, by province.

SCHEDULE B

I. OPERATIONAL COSTS - WATER QUANTITY SURVEY STATIONS EXCLUDING SEDIMENT

Objective Groups 01, 02, 03 - Salaries and Overtime

This includes salaries and overtime payments of field technicians and supervisors. To account for work on activities outside the Agreement on Water Quantity Surveys, adjustments are applied to reasonably reflect the work time.

Object Group 04 - Travel

This group of costs includes field travel expenses for field personnel and other employees required for hydrometric survey work in the respective province.

Object Group 06 - Transportation

Included under this object group are costs for the transportation of goods and materials by truck, air, rail, and water.

Object Group 07 - Telecommunications

Expenses included within group are telephone services directly related to hydrometric operations.

Object Group 08 - Telecommunications

This group includes message and data services directly related to the hydrometric survey, excluding data processing costs which are considered separately below.

Object Group 11 - Professional Services

This object group includes salaries of gauge readers at hydrometric stations.

Object Group 15 - Other Services

This group includes costs associated with graphic services, short term employment, photographic services, brokerage fees, storage, printing, and department of Supply and Services service charges.

Object Group 16 - Rentals

(i) Includes rentals of aircraft, vehicles, boats and light machinery used for maintenance of gauging facilities.

(II) Annual cost of land leases for the establishment of or access to gauging stations (includes recorder shelters and cableways).

Object Group 17 - Repairs to Equipment

Repair and upkeep of such items as road motor vehicles, instrumentation, electrical equipment, survey equipment, snowmobiles, motor boats, ATV's, trailers, etc.

Object Group 18 - Building and Structure Repairs

This object group deals with all work done under contract toward the repair and upkeep of gauging facilities including shelter, stilling wells, cableways, weirs, flumes, bridges, stairways, access roads, etc.

Object Group 19 - Public Utility Services

Electrical services obtained through a public utility company.

Object Group 20 - Purchased Materials

Gasoline and oil for road motor vehicles is the major cost item in this cost group. Other costs include gas and oil for other motorized equipment, building materials, nitrogen for manometer stations, propane, working clothes and footwear, recorder charts, etc.

Object Group 21 - Parts and Consumable Tools

Includes items such as plumbing equipment and fittings, electrical equipment and fittings, batteries, scientific equipment, heating equipment, measuring equipment, safety equipment, hand tools, boats, rubber tires, etc.

Data Processing Costs

Up to and including 1983-84, all data processing was done using the main frame computer facilities located at Bedford Institute of Oceanography. For 1983-84 the data processing cost amounted to $25,000.

During 1983-84, a PDP 11/44 mini computer system was installed at the offices of Water Resources Branch, Dartmouth. For 1984-85 the new facility was completely operational.

In accordance with "Compendium of Practices, Interpretations and Administrative Procedures used by Co-ordinating Committee in Implementing the Water Quantity Survey Agreements", the annual computing cost would include the capital expenditure for the mini computer system, the annual operating cost (AOC) and the annual maintenance cost (AMC). The capital is recovered over a ten year period through an imputed rental charge (IRC), determined by amortizing the capital expenditure over a period of ten years. Therefore, the evolving formula would be:

Total Shareable Annual Computing Cost = IRC + AOC + AMC

If the Total Shareable Annual Computing Cost exceeds the cost for the base year, 1983-84, multiplied by the annual national cost increase factors, then the latter cost will be used. This has been the case for the years 1984-85 to 1990-91, therefore, the base year cost updated by the national cost increase factors, has been used.

During 1990-91 a more modern/powerful micro VAX II (Q5 series) computer system was purchased as surplus equipment at considerably less cost than the PDP 11/44 computer. All existing software was adapted for use on the new computer and the PDP 11/44 was gradually phased out. For 1991-92 all data processing will be handled by the VAX system. At the same time a detailed inventory of all data processing equipment at Dartmouth and sub-offices was compiled, with an effective date of April 1, 1991. Starting with 1991-92 the data processing cost will be determined from the above formula. The IRC (Imputed Rental Charge) will be determined as 10% of all current equipment on inventory, as updated once per year.

In the Atlantic Region the Total Shareable Annual Computing Cost is proportioned among the four cost sharing agreements by the number of gauging station records processed.

Depreciation of Vehicles

Road motor vehicles in the Atlantic Region are depreciated in accordance to the "Compendium of Practices, Interpretations and Administrative Procedures Used by Co-ordinating Committees in Implementing the Water Quantity Survey Agreements". By this compendium Report the multi-purpose vehicles, vans and trucks used in the Atlantic Region are depreciated over a term of six years from the original capital purchase cost.

To calculate this depreciation, the actual capital cost of the vehicle is divided by 72 months to give a monthly depreciation. The monthly depreciation is multiplied by the actual number of months that a vehicle served in a particular province, to give the annual depreciation for the vehicle.

During the past two years pick-up trucks fitted with special enclosures for housing field equipment have been purchased to satisfy health and safety requirements. The enclosures are expected to serve for two vehicle lifetimes, and therefore, half the value of the enclosure is added to the vehicle purchase price for depreciation purposes.

Depreciation of Field Equipment and Instrumentation

Field equipment and instrumentation are depreciated at a rate of 10% of the current value of the cost-shareable inventory as determined once a year. Normally, only items acquired through capital purchases are included on the cost-shareable inventory.

II. THE OPERATIONAL COST OF SEDIMENT STATIONS

All cost items included in Section I except salaries, overtime and depreciation of vehicles, as they relate to Sediment Surveys, are included in the operational costs for the Sediment Network. Also included is the cost of laboratory analysis for suspended concentration and particle size distribution.

III. CONSTRUCTION AND MAJOR REPAIR COSTS FOR WATER QUANTITY SURVEY STATIONS

Once a major repair or new construction project has been identified, it is assigned a cost code to which all related costs are assigned. Some of this work is contracted out with the initial reconnaissance and the general supervision on-site provided by Water Survey of Canada.

If contracted out, the total cost is comprised of:

- Overtime of Water Survey of Canada supervisory personnel.

- Field travel expenses, board and lodging costs of supervisory personnel provided by Water Survey of Canada.

- If a pressure installation, the cost of the manometer and pressure unit accessory equipment such as gas and cylinders. The water level recorder is not charged.

- Charter aircraft.

- Land acquisition costs if any.

- Construction contract payments.

  Department of Supply and Services contract procedures are followed.

If constructed by Water Survey of Canada personnel, costs include:

- Overtime of Water Survey of Canada supervisory personnel.

- Field travel expenses, board and lodging costs of Water Survey of Canada staff. Expenses associated with reconnaissance and construction.

- If a pressure installation, the cost of the pressure unit and accessory equipment such as gas and cylinders.

- Construction materials - All items required for the construction of stilling wells, shelters, cableways, controls and survival shelters.

- Rental of aircraft, vehicles, boats, construction equipment associated with the project.

- Land acquisition costs if required.

- Construction contract payments - The services of construction equipment operators for backhoe and bulldozer are usually involved.

SCHEDULE C

PROCEDURES FOR PREPARATION OF ANNUAL PAYMENTS

SCHEDULE C

PROCEDURES FOR PREPARATION OF ANNUAL PAYMENTS

a) The annual payment is composed of two parts, the annual operating costs and the costs of construction for streamflow and water level installations and sediment installations.

b) The annual payment shall be computed for each year the agreement is in effect.

c) Cost data to be used as a basis for computing each annual payment will be the cost data from the latest available full fiscal year.

d) A cost index factor is to be used in computing the annual payment for the year in question commensurate with sound engineering practice.

e) The average annual unit costs for operating water quantity survey stations listed in Schedule A but not including sediment stations will be determined from the cost data of c) above and where necessary, because of significant differences in transportation costs, these average annual unit costs will be computed for more than one area or condition of operation.

f) The total annual operation cost of the water quantity survey stations listed in Schedule A but not including sediment stations will be the summation of the appropriate average annual unit cost for each station multiplied by the cost index factor as determined in item d) above.

g) The total annual operation cost of the sediment stations listed in Schedule A will be the summation of the annual operating cost for each station multiplied by the cost index factor as determined in item d) above.

h) The construction cost to be apportioned in accordance with Articles II, III and IV will be the summation of the construction cost for each new, or reconstructed water quantity survey station. The entire cost of construction is to be included in the annual payment. Construction costs are to be determined using data from reconnaissance surveys, standard plans, etc. and incorporating the cost index factor from item d) above.

i) In cases where there is a significant deviation between the cost determined in (f), (g) and (h) and actual costs because of the cost index factor used, or changes in the construction program due to unforseen circumstances such as flooding, an adjustment may be made in the final quarterly payment (March 1st) or the next fiscal year to more accurately reflect the cost shares of the parties to this agreement.

APPENDIX VII

SCHEDULE D

SUMMARY OF ANNUAL PAYMENT

SCHEDULE D

This schedule provides a summary of the annual payment. The details of the calculations for operation and construction are available and have been jointly reviewed by officers of each party.

ANNUAL PAYMENT FOR 1990-91 TO BE PAID TO THE RECEIVER GENERAL FOR CANADA BY THE PROVINCE OF NEW BRUNSWICK.

	Operation	Construction	Total
a) Streamflow and water level installations	$112,224	-	$112,224
b) Sediment installations	3,366	-	3,366
c) Groundwater installations	3,760*	-	3,760
d) Data Collection Platforms	2,582*	-	2,582
		ANNUAL PAYMENT	$121,932

*These charges are not cost shared by New Brunswick Electric Power Commission.

Julian Walker
Deputy Minister,
Department of the Environment

Administrator for Province

S. L. Fenety
Director, Atlantic Region
Inland Waters Directorate

Administrator for Canada

F.C. MacLoon
Executive Vice-President,
New Brunswick Electric
Power Commission

APPENDIX VIII

MINUTES OF COORDINATING COMMITTEE MEETING

WATER QUANTITY SURVEYS

CANADA-NEW BRUNSWICK

CO-ORDINATING COMMITTEE ANNUAL MEETING

1990-91

The Co-ordinating Committee for the Canada-New Brunswick Agreement on Water Quantity Surveys met on February 19, 1991 at Argyle Place, Fredericton, New Brunswick. In attendance at the meeting were the following:

D. McBride	-	Environment Canada, Dartmouth
N. Elhadi	-	New Brunswick Department of the Environment, Fredericton
J-G. Deveau	-	Environment Canada, Dartmouth
M. Sprague	-	New Brunswick Department of the Environment, Fredericton
R. Lane	-	Environment Canada, Fredericton
B. McLaughlin	-	New Brunswick Electric Power Commission, Fredericton
D. Randall	-	Environment Canada, Dartmouth

1. Annual Report for 1989-90

D. McBride referred to page no. 13 of the Annual Report where Schedule "D" payments for water quantity surveys are compared to actual provincial share of costs over the years of the Agreement. The net difference which last year represented a credit for the Province reversed direction to a Federal credit of $7,635 owing to a sizeable over expenditure during 1989-90. D. Randall in response to a question by N. Elhadi explained that the overexpenditure was attributed to the interim wage settlement and resulting backpay by technical staff and the ambitious maintenance program undertaken. N. Elhadi requested that he would like to see expenditures kept well in line with estimates for the future.

The salary projection for the current and the coming year were discussed. It was explained the backpay by technical staff as a result of the EG conversion of classifications will be considered a Federal initiative. The backpay received during 1990-91 will be removed from the accounting of technicians' salaries and not shared with the Province.

On the overtime topic R. Lane noted that the use of overtime in achieving certain station work plan goals has resulted in better quality data. D. Randall explained that a new method is being used this year such that it will be much easier to separate overtime pay for other activities, such as groundwater surveys or water quality sampling, from the regular overtime for water quantity surveys. For each overtime claim submitted the work activity must be described.

2. Recommendations from Hydrometric Network Evaluation

The group was referred to the minutes from the January 8, 1991 meeting of the Network Evaluation and Planning Advisory Committee (NEPAC) to check progress on the implementation of recommendations from the Hydrometric Network Evaluation.

a) Black Brook

It was noted that a proposed station on Black Brook for Agriculture Canada in the Grand Falls area is still on hold.

b) Bass River

In reference to the proposed discontinuance of a gauging station on Bass River, N. Elhadi asked if there was any interest from the City of Bathurst and possibly Fisheries and Oceans. It was noted that there was good network coverage in that sector of the province. Low flow recorded were unique possibly because the basin has little natural storage. The channel at the station has been unstable for some time since the replacement of the bridge upstream.

D. McBride said that a study should be undertaken to determine whether records may be correlated with other basins in the area. If there is a good correlation, then the Bass River station could be dropped from the network. The study could be completed by the Hydrology Division at the Dartmouth office.

It was noted that a network station was investigated at a number of potential sites in the Saint John area.

Assuming that the station on Bass River, presently a Federal 4 station, will be discontinued, J-G. Deveau suggested balancing the Federal-Provincial share by moving either the provincial station on Middle River or Nigadoo River to Federal-Provincial classification with the establishment of a new station near Saint John. N. Elhadi confirmed that the station on Nigadoo River would be the station to change in classification. It was also agreed that a letter should be sent to the City of Bathurst and Fisheries and Oceans Canada to signal the intentions of discontinuing the Bass River station and determine if they have any interest in supporting the continued operation.

c) Tobique River Basin

For the Tobique River Basin D. McBride reviewed that which had been discussed by NEPAC noting the New Brunswick Electric Power Commission (NBEPC) held the major interest. B. McLaughlin confirmed the interest by the Commission. N. Elhadi stated that the River Forecast Centre (RFC) is also interested in the Tobique River stations. R. Lane noted the difficulties in determining flows under winter backwater both at the RFC in real time computations and during the normal office computations for publication. B. McLaughlin explained the operation of the storage reservoirs throughout the seasons, including the effect on winter flows. N. Elhadi suggested that the issue on the operation of the Tobique River stations be sent back to NEPAC to consult and clearly identify the requirements of the two primary users, prior to any decision. This practice should be followed, in general, whenever discontinuance is contemplated.

d) Sediment Surveys

D. McBride noted the discontinuance of sediment sampling at Blackville station. This was necessary due to the continued vandalism and loss of sediment samplers. Roy Lane stated that miscellaneous sediment sampling will commence at the Blackville station as well as at the stations on the Northwest Miramichi River and Little Southwest Miramichi River. Also each member of the field technical staff will be assigned two stations to sample on a miscellaneous basis, i.e. one sample per open water visit.

In the NEPAC Second Annual Report a number of suggestions have been put forward for consideration. N. Elhadi stated that he wishes to see some dialogue with the users before discontinuing or adding stations. M. Sprague indicated that his Department has a definite interest in certain lakes in order to enforce regulations.

N. Elhadi suggested that NEPAC meet earlier in the year such that the Co-ordinating Committee will have ample time to review recommendations.

3. Schedule "A" Gauging Stations Responsibility Classifications - 1991-92

In light of the earlier discussion on Bass River, it was agreed that the station would be discontinued and removed from Federal 4 classification. A new station on Black River (near Saint John) would be added as a Federal-Provincial 3 network station. To offset the removal of one Federal station, the station on Nigadoo River would be moved from provincial category to Federal-Provincial 3.

4. Groundwater Survey

D. Randall explained the updated method of determining data processing costs with the new VAX Q5 computer. This has resulted in a lower cost for processing groundwater well charts. Therefore, the provincial costs for this service will be slightly lower for 1991-92.

5. Sediment Survey Network Changes

D. Randall responded to a question by N. Elhadi on the increase in the provincial share of costs for sediment. He explained that the number of samples was underestimated for 1990-91 and also the laboratory analysis costs have increased as a result of the substantial increase in laboratory technicians' salaries (EG group).

It was pointed out that the proposed miscellaneous sampling program is a federal initiative and there will be no cost to the Province.

6. Estimated Cost of Operations 1991-92

D. Randall reviewed the estimate of costs for 1991-92 for hydrometric, sediment, groundwater, recovery of costs for DCPs and proposed construction of one station.

N. Elhadi questioned the $5,000 Provincial share of construction costs set aside for the establishment of a new station, possibly Black Brook. D. Randall explained that previously most new stations were constructed in-house by Water Survey of Canada staff with costs included with the regular operational costs. Contractors have not been involved for many years. It is considered more appropriate to separate construction costs from the operational costs because of the potential difference in the percentage sharing of costs for construction as compared to operational costs.

D. Randall explained that the Provincial share of $5,000 for construction of a network station on Black River represented 50% of the estimated cost if the construction is completed by a contractor. It was noted that construction in-house would cost less. After discussion it was agreed to add an extra $6,000 to the figure presented for total operational costs ($362,500 + $6,000) and share this total cost in proportion to the distribution of station classifications.

Editorial Note (April 25, 1991):

In view of the fact that WRB Dartmouth had third party capital available, it was decided to separate construction cost from operational costs and show a Provincial share of $2,000 on the schedule "D", repre-
senting 50% of the estimated total cost.

7. Other Topics

a) Branch Reorganization

D. McBride discussed the proposed scheme for reorganization of Inland Waters Directorate. He noted the reorganization in

British Columbia where the Water Resources Branch was separated into five divisions. He also discussed the review of all water programs in Canada and the proposal to turn Water Resources Branch nationally into a Special Operating Agency. There is an alternative put forward to surrender water quantity survey operations to the provinces. N. Elhadi said that would not be a good decision should Canada wish to move in this direction because there would not be any uniformity in network coverage and quality of data.

b) P2000 - Modernization

The modernization project is moving forward. Alberta has been assigned the three year pilot project and will begin the conversion from analogue to digital data acquisition.

c) Purchase of Sutron 8200s.

D. McBride said that Water Resources Branch will purchase a few digital recorders this year, perhaps $30,000 worth. He said that the Branch will honour its commitment to match the purchases previously made by the Province in upgrading 3 stations with Sutron 8200 data loggers complete with modem.

e) Membership on Co-ordinating Committee

N. Elhadi will be recommending that M. Sprague represent the Province on the Co-ordinating Committee. He also said that, if approved, he will serve as the Administrator. D. McBride requested that a letter be sent to S. Fenety to confirm changes.

B. McLaughlin requested that the name "Lin Titus, President, New Brunswick Electric Power Commission" be placed on the Schedule "D" for signature.

d) Green Plan Significance

D. Randall said that about a dozen stream gauging sites in the Atlantic Region were identified for instrumentation upgrading in response to a request from Branch Headquarters, Ottawa. Headquartes will be presenting a national submission under the Green Plan for forecasting above major urban centres. M. Sprague noted a brief report from B. Burrell identifying a number of sites for a Green Plan proposal on environmental emergencies.

APPENDIX IX

ESTIMATED COSTS FOR 1991-92

WATER QUANTITY SURVEYS

PROVINCE OF NEW BRUNSWICK

1991-92

ESTIMATED OPERATIONAL COSTS FOR HYDROMETRIC SURVEYS

Personnel - Basic Pay - 01, 02, 03 (Salaries of hydrometric technical staff including overtime)	$253,500
Transportation and Communication	
Travel and Removal - 04	22,500
Transportation and Postage - 06	1,500
Telecommunications - 07, 08	1,500
Professional and Special Services	
Professional Services - 11	2,000
Other Services - 15	4,500
Rentals	
Rentals - 16	2,000
Purchased Repair and Upkeep	
Equipment Purchased and Repairs - 17	5,000
Building and Structures Repairs - 18	1,000
Utilities, Materials and Supplies	
Public Utility Services - 19	4,000
Purchased Materials - 20	20,000
Parts and Consumable Tools - 21	9,000
Other Costs - Data Processing Cost	11,500
- Depreciation of Vehicles	12,500
- Depreciation of Field Equipment and Instruments	12,000
TOTAL	$362,500

WATER QUANTITY SURVEYS

PROVINCE OF NEW BRUNSWICK

1991-92

ESTIMATED OPERATIONAL COSTS FOR SEDIMENT SURVEYS

Personnel - Basic Pay - 01, 02, 03	$ NIL
Transportation and Communication	
Travel and Removal - 04	$ 200
Transportation and Postage - 06	100
Telecommunications - 07	NIL
Professional and Special Services	
Professional Services - 11	3,000
Other Purchased Services - 15	NIL
Purchased Repair and Upkeep	
Equipment Purchased and Repairs - 17	NIL
Building and Structure Repairs - 18	NIL
Utilities, Materials and Supplies	
Public Utility Services - 19	NIL
Purchased Materials - 20	100
Parts and Consumable Tools - 21	NIL
Other Costs - Sample Analysis	7,000
- Depreciation of Field Equipment and Instruments	1,500
TOTAL	$11,900

CANADA-NEW BRUNSWICK COST SHARING AGREEMENT

WATER QUANTITY SURVEYS

1991-92 ESTIMATED PROVINCIAL COST

HYDROMETRIC

Station Distribution

F1	7
F2	2
F3	15
F4	16
FP2	2
FP3	26
P2	15 *
TOTAL	83

Average Cost/Station Unit = 362,500/83 = $4,367
Provincial Share = 4,367(28/2) + 4,367 (14)* = $122,276

* Stations on French Lake and Lake Utopia are only operated for a six month season each.

SEDIMENT

Station Distribution

F	1
FP	3
P	0
TOTAL	4

Average Cost/Station = 11,900/4 = $2,975
Provincial Share = 2,975 (3/2) = $4,462

GROUNDWATER

Estimated cost of processing one station chart per year - $295 (to be reviewed)
Stations involved - 8
Extra cost of travel to Shippagan (2) and Lameque - $1,200
Provincial cost = (8 x 295) + $1,200 = $3,560

DATA COLLECTION PLATFORMS

Total purchase cost - $25,823
Annual rental cost to Province - $2,582

TOTAL PROVINCIAL SHARE

Hydrometric + Sediment + Groundwater + DCPs + Construction (Black Bk)
$122,276 + $4,462 + $3,560 + $2,582 + $2,000 = $134,880